A publication by the Department of Housing and Community Development – Division of Building and Fire Regulation

September/October 2003

Code Connection

Jack Wants You to Know

The effective date for the new building and fire regulations will be October 1, 2003. The official versions should be available in the coming weeks and notification of their availability will be provided on the Virginia Department of Housing and Community Development (DHCD) website and through other means. We are currently working with the International Code Council (ICC) staff to produce either a separate publication or an appendix to the Virginia Uniform Statewide Building Code (USBC) which will contain the full text of all of the provisions of the ICC 2001 Supplement and the ICC 2002 Accumulative Supplement which have been incorporated into the USBC.

DHCD is also anticipating starting a new code change cycle. A preliminary schedule for approval by the Board of

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Inside this issue

Beneficial Features of the ICC International Residential Code (IRC)

By Lynn Underwood, Building Official, City of Norfolk

Background

The International Residential Code scheduled to be adopted by Virginia, effective October 1, 2003, is based on years of experience and technical expertise from the organizations that created the International Code Council. The IRC deals with all aspects of residential construction, including plumbing, mechanical, electrical, as well as life safety and structural design. It is filled with highly descriptive tables, charts, graphs, and other details that explain code requirements in a clear, visual manner. The IRC also features time-tested safety concepts, updated means of egress and interior finish requirements, comprehensive roof provisions, seismic engineering provisions, innovative construction technology, revamped structural provisions, reorganized occupancy classifications, and the latest industry standards in material design.

IRC is a unifying document that establishes a common set of rules for residential construction throughout the United States.

Single Integrated Document

The IRC is a single volume that includes all of the criteria needed for a homebuilder, which makes it extremely useful. Structural, architectural, plumbing, mechanical, and electrical aspects are integrated. It is natural that the codes be integrated since the various aspects of construction must be integrated. The requirement for a smoke detector is found in the building code, yet the electric code tells us how it should be installed. The building code establishes the requirements for sanitation, including water closets, showers, and sinks, yet the plumbing code tells how they must be installed. The building code establishes the requirement for heating a dwelling, yet the mechanical code sets standards on the equipment installation.

Improved Clarity

No other building code has as many visual aids --- drawings, tables, charts, and graphs --- which clarify the intent of the legal language. Numerous line drawings are labeled and indicate the code requirements in a particular application of construction. Both builder and inspector can thereby more easily agree on the meaning of terms used within the code. Consequently, there will be fewer disputes about the purpose of a code provision. Since many disputes between builder and inspector were the result of a general disagreement of the meaning of the terms, this feature alone sets the IRC apart from any of its contemporaries or predecessors. In previous editions, model code organizations published separate commentaries and guides to provide this information, which cost extra.

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Good Things to Know

Certification Examination Practice Courses

In the ICC Campus Notes for June, there is a description of the 2000 IPC Commercial Plumbing Inspector Certification Examination Practice Course now available from ICC Campus Online. This course will assist individuals in practicing for the 2000 IPC Commercial Plumbing Inspector Certification Examination based on the 2000 IPC, 2000 IFGC, and ICC/ANSI A117.1, 1998. Upon completion of the course, ICC states that you will be better able to:

1. Effectively manage time while taking a timed examination.
2. Answer questions.
3. Determine strengths and weaknesses in code knowledge and application.
4. Explain the actual job tasks referenced in development of the exam.
5. Explain which code sections and references pertain to each job task.
6. Locate key code sections and references.

Cost: $40.00 Access this course by visiting www.icccampus.org

In the ICC Campus Notes for July, it is announced that there are two new certification examination practice courses "coming soon":

1. 2000 IBC Building Plans Examiner
2. 2000 IPC Residential Plumbing Inspector

For up-to-date information, visit www.icccampus.org

IAEI Virginia Election of Officers and Inspector-of-the-Year

At the 67th Annual Meeting in June 2003 of the Virginia Chapter of the International Association of Electrical Inspectors (IAEI), David Humphrey, Senior Electrical Inspector, Henrico County, was elected as the President of IAEI Virginia for 2003-2004. David was also selected as the Chapter's Inspector-of-the-Year for 2002-2003. The full slate of elected Officers for 2003-2004 includes:

President:
David Humphrey, Henrico County
Vice-President:
Larry Waldron, Roanoke County
Secretary/Treasurer:
H.J. Sonny Lamb
Assistant Secretary/Treasurer:
Chuck Grant, City of Roanoke
Chaplain:
Craig Williams, Fairfax County
Immediate Past-President:
Terry Moore, Fairfax County

For up-to-date information on IAEI VA, visit their website: www.iaeivirginia.org

Quips and Quotes:

- On the training side: The one thing worse than training your people and losing them is not training them and keeping them.
- On the bold side: There are bold electricians and old electricians, but there are no old bold electricians.
- On the light side: If anything can go wrong, fix it (Forget Murphy!)

DBFR Employees Recognized by IAEI Virginia

On June 9, 2003 at the 67th Annual Meeting of the Virginia Chapter of the International Association of Electrical Inspectors (IAEI), members of the Division of Building and Fire Regulation (DBFR) were recognized for their outstanding contributions to IAEI VA. The DBFR members were Jack Proctor, Deputy Director DBFR, Norman Crumpton, Technical Services Manager, and Dan Gilham, Virginia Building Code Academy Manager. In addition to recognition for outstanding contributions to IAEI VA, Norman Crumpton received special recognition for his day-to-day work with IAEI VA members. Dan Gilham was recognized with an outstanding service award for the contributions of the Virginia Building Code Academy to IAEI VA. And, Jack Proctor was recognized for his career-long outstanding support of IAEI VA with an honorary lifetime membership in IAEI International.

Virginia Building Code Academy to Present at Nashville ICC Codes Forum

Individuals representing the Virginia Building Code Academy have been selected to present at the Codes Forum "Cracker Barrel" on Wednesday, September 10, 2003, from 12:00 pm to 1:30 pm. The subject will be "Code Enforcement Training That Works". The presenters will be Jack Proctor, Deputy Director DHCD/DBFR, Dan Gilham, Manager DHCD's VBCA, and Jim Moore, Advanced Instructor VBCA and Supervisory Inspector for Fairfax County. If you are in Nashville at this time, come visit our "Cracker Barrel" table.

New Fire Protection Inspector

The Northern Regional State Fire Marshal's Office has a new Fire Protection Inspector, Timothy J. Ritchey. Tim has many years of experience and was previously a Fire Safety Officer at the University of Virginia.

Code Change Training Update

DHCD, VBCOA, VPMIA and IAEI delivered statewide mandatory code change training for all certified personnel beginning in July 2003 - September 2003. The training was driven by the Board of Housing and Community Development's adoption of the International Codes scheduled to become effective October of 2003. The training was as follows:

- Chapter One - Administrative and State Amendments (Requirement for all certified personnel)
- 2003 Edition of International Fire Prevention Code (Required for all certified Fire Prevention Inspectors)
- 2000 Edition of International Residential Code (Required for certified One & Two Family Dwelling Inspectors)
- 2000 Edition of USBC - Plumbing, Mechanical, Gas and Electrical (Required for all certified Plumbing, Mechanical, Gas and Electrical Inspectors)
- 2000 Edition of International Building Code (Required for all certified Building inspectors and Plans Reviewers)

Note: If you missed any of these sessions watch the next issue of "Code Connection" for an outline of make-up dates. ❑

Preparing To Take A Certification Examination

By Dan Gilham, Manager VBCA/TCO

Background

This article is published to assist individuals throughout Virginia to pass their certification examinations. Material in this article is adapted and extracted with permission from Mike Holt's website: www.mikeholt.com Please note that this material is provided by the DHCD Training and Certification Office for information only with no guarantee that the use of this material will produce the results desired by an individual regarding passing a certification examination. Having made this disclaimer, it should also be noted that Mike Holt's website contains a wealth of information useful to electrical inspectors and combination inspectors. For example, you can access a free newsletter and you can enroll in a free online, NEC practice examination course. Although dedicated to serving practitioners and inspectors using and applying the National Electrical Code (NEC), this website has a lot of generic information relevant and useful to any inspector and anyone in code enforcement who needs to prepare for and pass a certification exam. By visiting Mike Holt's website, you can click on "Exam Prep" and access these elements: 1) Getting Started: The Emotional Aspect of Learning; and, 2) How To Take the Exam. A sample of the generic material on this website, relevant to anyone preparing to take a certification examination, is provided as follows:

How To Take The Exam (From www.mikeholt.com)

Being prepared for an exam means more than just knowing electrical concepts, the Code, and the calculations. Have you felt prepared for an exam, then choke when actually taking it? Many good and knowledgeable electricians couldn't pass their exam because they did not know how to take an exam. Taking exams is a learned process that takes practice and involves strategies. The following suggestions are designed to help you learn these methods.

- Changing Answers: When re-reading the question and checking the answers during the fourth pass, resist the urge to change an answer. In most cases, your first choice is best and if you aren't sure stick with the first choice. Only change answers if you are sure you made a mistake. Multiple choice exams are graded electronically so be sure to thoroughly erase any answer that you changed. Also erase any stray marks from the answer sheet.
- Check Your Work: The first thing to check (and you should be watching out for this during the whole exam) is to make sure you mark the answer in the correct spot. People have failed the exam by one half of a point. When they reviewed their exam they found they answered several questions correctly on the test booklet, but marked the wrong spot on the exam answer sheet. They knew the answer was “(b)” False, but marked in “(d)” in error. Another thing to be very careful of is marking the answer for let's say question 7, in the spot reserved for question 8.
- Guessing: When time is running out and you still have questions remaining, GUESS! Never leave a question unanswered. You can improve your chances of getting a question correct by the process of elimination. When one of the choices is (A) none of these, or (A) none of the above, it is usually not the correct answer. This improves your chances from one-out-of-four (25%) to one-out-of three (33%). Guess "All of these" or "All of the above", and don't select the high or low number. How do you select one of the remaining answers? Some people toss a coin; others will count up how many answers were A's, B's, C's, and D's and use the one with the most as the basis for their guess.
- Proper Supplies: First of all, make sure you have everything needed several days before the exam. The night before the exam is not the time to be out buying pencils, calculators, and batteries. The night before the exam, you should have a checklist (prepared in advance) of everything you could possibly need. The following is a sample checklist to get you started:
  - Six sharpened #2H pencils or two mechanical pens with extra #2H leads. The kind with the larger leads is faster and better for filling in the answer circles.
  - Two calculators, just in case. Most examining boards require quiet, paperless calculators. Solar calculators are great but there may not be enough light to operate them.
  - Spare batteries.
  - Extra eye glasses if you use them.
  - Have all of your reference materials, even the ones not on the list. Let the "Exam Proctors" tell you which ones are not permitted.
  - A thermos of something to drink. For example, coffee.
  - Some fruit, nuts, candy, aspirin, analgesic, etc.
  - Know where the exam is going to take place and how long it takes to get there. Arrive at least 30 minutes early. It's a good idea to pack a lunch rather than going out. It can give you a little extra time to review the material for the afternoon portion of the exam, and it reduces the chance of coming back late.
- Relax: This is easier said than done, but it is one of the most important factors in passing your exam. Stress and tension cause us to choke or to forget. Everyone has had experiences where they get tense and couldn't think straight. The first step is becoming aware of the tension and the second step is to make a deliberate effort to relax. Make sure you are comfortable; remove clothes if you are hot, or put

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Preparing To Take A Cert. Exam.
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on a jacket if you are cold. There are many ways to relax and you have to find a method that works for you. Two of the easiest methods that work very well for many people follow:

- Breathing technique: This consists of two or three slow deep breaths every few minutes. Be careful not to confuse this with hyperventilation, which is abnormally fast breathing.
- Single-Muscle Relaxation: When we are tense or stressed, many of us do things like clench our jaw, squint our eyes, or tense our shoulders without even being aware of it. If you find a muscle that does this, deliberately relax that one group. The rest of the muscles will automatically relax. Try to repeat this every few minutes and it will help you stay more relaxed during the exam.

- Rounding: You should always round your answers to the same number of places as the exam's answers. Numbers below .5 are rounded down, while numbers .5 and above are rounded up.
  - Example: If an exam has a multiple choice of: (a) 2.2, (b) 2.1, (c) 2.3, and (d) none of these, and your calculation comes out to 2.16, do not choose the answer (d) none of these. The correct answer is (a) 2.2, because the responses are rounded off to the tenth.
  - Example: It could be rounded to tens, such as: (a) 50, (b) 60, (c) 70, and (d) none of these. For this group, an answer such as 67 would be (c) 70, while an answer of 63 would be (b) 60.
  - General Rule: The general rule is to check the question's choice of answers and then round off your answer to match it.

- Skip the Difficult Questions: To answer a question correctly, you must first understand the question. One word in a question can totally change the meaning of it. Carefully read every word of every question. Underlining or noting key words in the question will help you focus. Contrary to popular belief, you do not have to answer one question before going on to the next one. The irony is that the question you get stuck on is one that you will probably get wrong anyway no matter how much time you spend on it. This will result in not having enough time to answer the easy questions. You will get all stressed-out and a chain reaction is started. More people fail their exams this way than for any other reason. The following strategy should be used to avoid getting into this situation.
  - First Pass: Answer the questions you know. Give yourself about 30 seconds for each question. If you can't find the answer in your reference book within the 30 seconds, go on to the next question. Chances are that you'll come across the answers while looking up another question. The total time for the first pass should be 25% of the exam time.
  - Second Pass: This pass is done the same as the first pass except that you allow a little more time for each question, about 60 seconds. If you still can't find the answer, go on to the next one. Don't get stuck. Total time for the second pass should be about 30% of the exam time.
  - Third Pass: See how much time is left and subtract 30 minutes. Spend the remaining time on each question. If you still haven't answered the question, it's time to make an educated guess. Never leave a question unanswered.
  - Fourth Pass: Use the last 30 minutes of the exam to transfer your answers from the exam booklet to the answer sheet. Read each question and verify that you selected the correct answer on the test book. Transfer the answers carefully to the answer sheet. With the remaining time, see if you can find the answer to those questions you guessed at.

Remember: In the first pass, answer only the easy questions. In the second pass, spend a little more time per question, but don't get stuck. In the third pass, use the remainder of the time minus 30 minutes. In the fourth pass, check your work and transfer the answers to the answer sheet.

Summary

- Make sure everything is ready and packed the night before the exam.
- Don't try to cram everything the night before the exam.
- Have a good breakfast.
- Get the thermos and energy snacks ready.
- Take all your reference books.
- Let the exam proctors tell you what you can't use.
- Know where the exam is to be held and be there early.
- Bring your ID and your confirmation papers (if there are any) for admittance to the examination and test room.
- Review your NEC while you wait for your exam to begin.
- Try to stay relaxed.
- Determine the time per question for each pass and don't forget to save 30 minutes for transferring your answers to the answer sheet.
- Don't get stuck on any one question. More people fail their exams this way than for any other reason.
- Read each question carefully.
- Be sure you are marking the answer in the correct spot on the answer sheet.
- Don't get flustered or extremely tense.

NOTE: The above was extracted and adapted from Mike Holt's website:
www.mikeholt.com
Telephone: 1-888-NEC-CODE.
Address: 7310 West McNab Road, Suite 201, Tamarac, Florida 33321

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Housing and Community Development is being developed that would start the code change cycle in the fall of 2003. The purpose of the new code change cycle is to address legislative issues, further develop the rehabilitation code and review the 2003 editions of the International Codes for adoption into the state building and fire regulations. Code change submittals will be accepted through the spring of 2004 and further time frames and specifics will be provided on the DHCD website at www.dhcd.state.va.us and in the Code Connection. ❑

Flammable Vapor Ignition Resistant Water Heaters

By Dave Johnston, Washington Gas

Following is a summary of information related to Flammable Vapor Ignition Resistant (FVIR) gas water heaters that began to be introduced to the market in July 2003.

What's happening?
In an effort to reduce ignition by residential water heaters of vapors from spilled flammable liquids such as gasoline, the ANSI standards for such appliances are being changed. To meet the new standard each appliance must pass a test for resistance to ignition of flammable vapors. The test involves spilling a quantity of gasoline in a closed chamber containing an operating water heater; the water heater must not ignite vapors outside the appliance. This new requirement will necessitate design changes in all new residential gas water heaters. It will also impact industry practices in areas of code application, operation, maintenance and troubleshooting.

Existing water heaters are not affected. All code provisions applicable to the installation, maintenance and operation of existing water heater designs remain in force and continue to ensure the safe use of these appliances. As before, gasoline and other flammable liquids should not be stored or used in an area containing combustion equipment or electrical equipment having switches or other arc-producing components.

When does it happen?
The effective date for all atmospherically vented 30, 40, and 50-gallon water heaters certified by CSA International (the major certifying organization for water heaters in the US) is July 1, 2003. For power vented 30, 40 and 50 gallon water heaters, the effective date is July 1, 2004. All other water heaters with input less than or equal to 75,000 Btu must comply by July 1, 2005. Although combo water heaters are not required to comply this year, it appears that the water heater industry will voluntarily bring them into compliance this July in order to avoid confusion in the marketplace.

Some models of FVIR water heaters are already on the market. By the effective date, all newly-manufactured water heaters must be certified under the new requirement. Existing inventory will be allowed to pass through the pipeline, but it is expected that only FVIR water heaters will be available for sale shortly.

Will there be a price increase?
Initial estimates suggested that FVIR water heaters would cost about $60 more than equivalent non-FVIR models at retail. There have been subsequent reports from the field that the actual increase is more on the order of $100.

How have designs changed to meet the requirements?
There are currently four major water heater manufacturers in the US residential market: American, Rheem, AO Smith/State, and Bradford White. In order to meet the new FVIR standard, there are variations in the design employed by each. However, all of the designs to date are based on the same principle: use of a flame arrestor screen to prevent propagation of any flame from inside the water heater to the surrounding atmosphere.

In all of the currently-announced designs, the combustion chamber is closed so that all combustion air must enter through the flame arrestor screen, located in the bottom of the water heater. The screen is composed of multiple slots or perforations that increase the velocity of the air as it enters. If a flammable vapor is carried into the combustion chamber along with the air, it may be ignited by the burner flame or pilot. However, the flame is prevented from being carried back through the screen by the higher velocity of the air through the slots.
Because the combustion chamber is closed, all of the designs use a push-button piezo pilot ignition system. All of the designs include a sight glass to verify ignition and observe the burner flame. This should make lighting of water heaters a safer and more convenient operation, especially for consumers.

All of the designs incorporate some automatic means of shutting down the water heater in the event of a flammable vapor ignition inside the combustion chamber. However, the means employed to do this, and certain other design features, affect how the water heater is serviced, especially after an incident. Below are brief descriptions of the manufacturer's design and their current policies on response to a shutdown. These policies may change as field experience is gained.

American's FlameGuard system. Like a conventional water heater, American's FVIR design is mounted on legs. Air simply passes from the underside of the water heater through the flame arrestor. In the event of an ignition, a sensor incorporated into the thermocouple responds to the unusually high temperatures by shutting down the gas supply. The flammable vapor may continue to burn inside the combustion chamber as long as it is drawn in. Because this may excessively stress the internal components, the shutoff switch is not resettable. American requires that the entire water heater be replaced in the event of a shutdown by this switch. The switch is also designed to shut down in the event that a lint or dust buildup on the flame arrestor restricts combustion air and thus causes high temperatures within the chamber. In this scenario, the thermocouple may be replaced without replacement of the entire appliance.

AO Smith/State's C3 system. The AO Smith/State design is mounted on a pedestal rather than legs, but air is still drawn directly from floor level. The flame arrestor is a perforated ceramic corderite plate. A thermal cutoff switch is incorporated into the thermocouple to shutoff the gas supply in the event of

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Flammable Vapor Ignition Resistant Water Heaters

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excessive temperatures from vapor ignition or restricted air. The switch automatically resets after the unit cools, and the pilot can be relit at that time, although AO Smith recommends that the unit be inspected. Unlike the other designs the AO Smith/State design has a removable air filter in the pedestal base. The filter is meant to remove lint dust and oil (LDO) and prevent it from reaching the corderite plate. The company states that the filter will require periodic maintenance, i.e. cleaning.

Rheem's Guardian system. Rheem's water heater stands directly on the floor, without legs or pedestal. The outer jacket contains a grille with numerous holes about 6 inches above the floor. Air is drawn in though this grille, down the side and under the combustion chamber, and up through the flame arrestor. The intention of drawing the air from above the floor is to minimize collection of LDO and prevent the entrance of flammable vapors at least until a pool of vapors reaches the height of the grille. Rheem also claims that the changes in direction of the air flow causes part of LDO to drop out. Rheem's design uses the thermocouple to shut off the gas supply in the event of a flammable vapor ignition, and also a spring-loaded cover that shuts off the air supply into the combustion chamber. The thermocouple switch acts only as long as the excessive heat is present in the combustion chamber, so an attempt could be made to reignite the water heater after an incident. However, the air shutter is not resettable, so an ignition attempt would ultimately fail. Rheem requires the water heater to be replaced after an incident.

Bradford White's Defender system. Bradford White's FVIR entry also sits directly on the floor, but the air intake louvers are not located substantially above floor level. Air is drawn under the combustion chamber and up through the flame arrestor screen, which contains thousands of tiny slots and covers the entire bottom. The design uses a manually-resettable thermal switch, separate from the thermocouple, to shut down the burner in the event of an incident. Because the switch is resettable, the unit can be returned to service after an incident. However, Bradford White still recommends complete replacement of the unit after a flammable vapor ignition. Replacement is not necessary if the shutdown occurs as the result of overheating from the flame arrestor being clogged by LDO.

Water heaters may be private-labeled and marketed under different brand names, but the four designs described here represent all of the FVIR water heaters expected to be initially available on the market.

Identification of FVIR units

The rating plate for FVIR-certified units will indicate that it is certified under ANSI Z21.10.1-2002 edition. Other than the physical differences described above, there is no other means of distinguishing an FVIR water heater from a conventional one.

Code considerations

Building and gas codes have for years required water heaters and other appliances located in garages to be elevated such that any ignition source is located at least 18 inches above the floor. This is to delay, and hopefully prevent, ignition of a pool of vapors that might form if a flammable liquid were spilled in an area. The advent of FVIR water heaters makes this precaution unnecessary for such units. Both the 2002 National Fuel Gas Code (NFGC) and 2003 International Fuel Gas Code (IFGC) include exceptions to the 18-inch elevation requirement if the appliance is listed as flammable vapor resistant and for installation without elevation.

The warning label advising that the unit should be elevated, previously required for all water heaters, has been modified for FVIR water heaters to remove the reference to elevation. Such water heaters should therefore not be required to be elevated in jurisdictions governed by the above codes. However, not all jurisdictions have adopted the most recent editions of the codes. Below is a summary of how the jurisdictions in Virginia are expected to handle elevation when FVIR water heaters become available.

Adoption of the 2000 IFGC is nearly complete in Virginia, without an amendment exempting FVIR water heaters from elevation. However, Virginia's code includes a strong provision for modifications based on provisions of upcoming codes. It will, at least initially, be necessary for the permit holder to apply for a modification of the elevation requirement based on the exception in the 2003 IFGC. The code official is not obligated to grant the modification, but it is expected that most will. The modification may eventually become a matter of standing policy not requiring a formal application for each installation.

There do not appear to be any other code provisions for installation of water heaters directly affected by the change to FVIR designs. However, as is always the case, all water heaters must be installed in accordance with manufacturer's instructions. Any instructions pertaining to a manufacturer's FVIR model must be followed.

Installation considerations

Installation without elevation will permit water heaters to be installed with about 18 inches more vent connector rise, which will help in flue priming and may permit smaller vent sizes in marginal cases when interconnected with a natural draft furnace.

Because all of the current designs make combustion air pass under the combustion chamber, care must be taken when the water heater is placed in a drain pan to prevent standing water above the lowest level of the air passageways. The outlet drain tap must not be located on the side of the pan above the level of the water heater air intake or the bottom of the combustion chamber, whichever is lower. Ideally, the drain tap will be located on the bottom or the lowest possible level on the side of the drain pan.

The drain pan itself must be large enough in diameter so that air can flow between the water heater and the pan without restriction. Some codes specify the minimum annular space between the water heater and the pan. It is not clear whether these clearances will be

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sufficient to provide for combustion airflow. The International Plumbing Code does not address drain pan clearance from the water heater.

Maintenance and service considerations

Since all designs utilize a flame arrestor screen, all may be susceptible to clogging by lint, dust and oil. All are designed to shut down if clogging reduces the combustion airflow to the extent that temperatures rise in the combustion chamber. Manufacturer's requirements about what to do in the event of such a shutdown vary. Some manufacturers will apparently require that the entire unit be replaced regardless of the reason for shutdown. To avoid the expense of replacing the water heater, or at minimum a service call, consumers would be well-advised to keep the screens clean.

AO Smith/State includes a removable filter for LDO, which will apparently require periodic cleaning. The frequency of cleaning is not yet known and will depend probably on environmental conditions. It is not clear what happens if the filter is not kept clean, although presumably the unit will eventually shut down and need to be inspected before being returned to service.

In order for the FVIR designs to work the combustion chamber must be kept closed so that all combustion air is drawn through the flame arrestor. Objects such as gas pipe and thermocouple leads that penetrate the combustion chamber must be surrounded with gaskets or grommets to maintain a seal. The designs also typically include a removable, sealed cover to provide access to the burner area. Anytime a part is removed and replaced, or the cover opened, the sealing means must be carefully restored. In some cases this means inserting the part through a grommet or replacing a gasket. None of the designs currently includes an interlock or other means to prevent operation if parts are not properly replaced.

All FVIR designs will have some unique parts that are not interchangeable with those for conventional designs. American and AO Smith/State use a special thermocouple that incorporates means to shut down the burner in the event of excessive combustion chamber temperatures. Rheem uses a conventional thermocouple, but this is dependent on a special, fire sprinkler-type glass bulb link that shuts off combustion air in the event of high temperatures. Bradford White uses a separate, resettable sensor to shut down the unit. These thermocouples can be replaced as part of routine troubleshooting, but not if the safety interlock has been actuated by an over temperature event. There should be no need to replace separate safety controls.

The temptation will be great for service people to save the customer money and hassle by overriding or bypassing the non-resettable safety switches. The industry will need to impress upon them, through training and enforcement, that such short cuts jeopardize safety and are not acceptable. Additional maintenance and service considerations will no doubt come to light after manufacturers publish service manuals and experience is gained from the field. It is clear that consumers will need to interact more with their water heaters, both for routine maintenance and to deal with unexpected shutdowns. Service people will need to be aware of the unique characteristics of these units and their critical dependence on careful and correct service techniques. ❑

For more information, or to share information from field experience with FVIR water heaters, contact Dave Johnston, Washington Gas, at (703) 750-4210.

Wanted - Volunteer Mentors

By Sharon Finan, Certification Program Manager, DHCD

Do you easily pass national certification examinations? Do you have difficulties with national certification examinations but have figured out a way to pass? In either case, would you be willing to share your secrets and methods for success? More importantly, for those fellow Virginians having difficulty with their exams, would you be willing to volunteer as a Virginia Mentor?

The Training and Certification Office is in the process of developing a Virginia Directory of Certification Examination Mentors. The role of the Mentor would be to assist fellow Virginians to pass their certification exams. Mentoring would be by area of expertise and by email and telephone. If interested in becoming a volunteer Virginia Mentor, please provide the following information:

1. Name and Position:_____
2. Professional Certifications:_____
3. Email:_____
4. Address:_____
5. Phone:_____
6. Fax:_____
7. Prior Mentoring experience:_____
8. Areas of expertise for Mentoring:_____

If you wish to volunteer, please forward this information to Sharon Finan, Certification Program Manager and Coordinator for this project, at: Department of Housing and Community Development, Training and Certification Office, 501 N. Second Street, Richmond, Virginia 23219.

For questions or additional information related to this project, please contact Sharon at: sfinan@dhcd.state.va.us or by phone at (804) 371-7185. We look forward to including your name as a Mentor in our Virginia Directory. ❑

Spotlight on the Virginia Plumbing and Mechanical Inspectors Association

By Jim Moore, VPMIA

History: In 1959, a small group of Virginia plumbing inspectors got together after attending a seminar in Blacksburg, Virginia. The group came together to discuss the possibility of forming a statewide association to disseminate information on new methods, materials, and testing procedures used in the plumbing and heating profession. The first formal meeting of the group took place on April 14, 1962 at the John Marshall Hotel in Richmond. At this meeting, participants decided to name their new group the Virginia Plumbing Inspectors Association (VPIA). The officers elected to lead the new association were: President, Charles E. Mannion, Richmond; Vice President, Paul C. King, County of Fairfax; Secretary, John B. Mason, Richmond; Treasurer, James B. Jones Jr., Martinsville; and, Sergeant-At-Arms, E. R. Carr, Winchester. Members of the Association's Board of Directors included: U.E. Allen, Jr., Portsmouth; Frank B. Bosman, County of Arlington; and, Gordon Dameron, Danville.

The purpose of the newly founded Virginia Plumbing Inspectors Association as set forth in the original by-laws included:

- Cooperate in the formulation of Virginia Plumbing Code Standards.
- Promote uniform understanding and application of all city, town, and county plumbing codes.
- Secure and promote uniform administrative ordinances and inspection methods.
- Promote closer cooperation between inspectors, inspection departments, health departments, plumbing contractors and the public.
- Promote and improve the standards of the profession of plumbing inspectors.
- Institute and maintain a central organization to properly test new materials and methods to be used in the commonwealth.

It should be noted that the original members of the Virginia Plumbing Inspectors Association (VPIA) foresaw the need in 1962 for a uniform statewide understanding and application of the plumbing code prior to the development of a Virginia Uniform Statewide Building Code (USBC) in 1973.

Change From VPIA to VPMIA: In 1990, the Virginia Plumbing Inspectors Association (VPIA) voted unanimously to change their name to the Virginia Plumbing and Mechanical Inspectors Association (VPMIA). The decision to change the name was in response to the increasing number of localities and jurisdictions within the Commonwealth of Virginia that had established separate mechanical inspection divisions. These mechanical inspectors were seeking a source for professional training and education. At this time, the VPIA membership agreed that their association renamed as VPMIA could serve as a source of professional training and education for both plumbing inspectors and mechanical inspectors.

Success: VPMIA has been highly successful since its founding. For instance in 2002, VPMIA, Chapter 29, received the "Chapter of the Year Award" from the Building Officials and Code Administrators International (BOCA). This award is bestowed on a BOCA Chapter that excels in educational opportunities, membership, participation in BOCA activities, and other related activities.

Vision: VPMIA members are committed to providing code development leadership and continuous training that results in the uniform application of the codes. We look for opportunities to partner with all who are impacted and strive to develop and deliver codes and standards that result in the protection of the health, safety and welfare of the public.

Mission: VPMIA is an association of code professionals dedicated to the promotion of uniform enforcement and development of the codes throughout the Commonwealth to assure the health, safety, and welfare of its citizens and any one who may live in, work in, or visit Virginia. The pursuit of this endeavor is achieved through close, open, and equal working relationships with design professionals, builders, contractors, material manufacturers and others involved in the construction industry. VPMIA supports the ICC goals and missions as an ICC Chapter.

Strategic Plan: The Virginia Plumbing and Mechanical Inspectors Association strategic plan is to advance our mission through training in order to promote better understanding of the benefits and efficiency of using model codes. The Association promotes teamwork, while embracing fairness and respect to all involved parties, always maintaining open communications in every aspect to those who participate in the process.

Training: Pursuant to achieving one of its primary objectives, VPMIA offers a 3-day annual School of Instruction in the spring and a 1-day annual training seminar in the summer. Many VPMIA members have also participated in the development and delivery of the Virginia Building Code Academy's mechanical inspection module and plumbing inspection module, including a PowerPoint presentation that simulates in the classroom the end-to-end residential and commercial plumbing inspection process and mechanical inspection process. Portable "walls" which display basic plumbing and cross-connection installations and materials were also designed and developed by VPMIA members for use in teaching plumbing inspection in the classroom by the Virginia Building Code Academy.

Code Change Training: This year VPMIA is also providing code change/update training in concert with DHCD as a result of the Board of Housing and Community Development's adoption of the 2000 International Codes. VPMIA has developed instructional materials for presenting code changes/updates on the 2000 International Plumbing Code, 2000 International Mechanical Code, 2000 International Fuel Gas Code, and 2000 International Residential Code (both plumbing and mechanical sections of the code). ❑

Officers: The current officers of the VPMIA are:

President:
Guy Tomberlin, Fairfax County
Vice- President:
Geary Showman, Shenandoah County
Secretary:
Michael Thuot, Fairfax County
Treasurer:
John B. Seay, Jr., Albemarle County
Exec. Secretary:
Paul Hostetler, Charlottesville (Retired)

For more information on the Virginia Plumbing and Mechanical Inspectors Association (VPMIA) visit their website at: www.vpmia.org.

Computerized Study Guides for Certification Examinations

By Dan Gilham, Manager, VBCA/TCO
(adapted by permission from material provided by InternationalCodes.com)

Seminars & Company, doing business as InternationalCodes.com, has produced a series of computerized study guides for use in preparing for the following certification exams:

1. 2000 IBC Plan Review
2. 2000 IBC
3. 2000 IPC
4. 2000 IMC
5. 2000 IRC
6. 2000 IFC
7. 1999 NEC
8. 2002 NEC
9. 2000 IRC Electrical Code

Most guides are on standard 3.5" computer diskettes that you can operate from your disk drive or load onto your hard drive. Some of the guides are available on CD.

According to Seminars & Company, these computerized study guides are a proven method for increasing your knowledge of the International Codes and assisting in preparing for certification exams through the use of selected questions with answers/references provided. All of the study guides are developed by practicing professionals and are tested for their effectiveness in preparation for certification exams as well as assisting in learning the codes. Moreover, the company states that their programs provide a convenient and "very efficient method of studying effectively at your desk with your IBM compatible computer." You can use their programs to learn the new code format, chapter and section locations, and review and prepare for certification exams as the programs contain hundreds of code questions followed by correct answers and code references. Each question, in multiple choice or true/false format, allows you to look for the answer in your codebook, and then check for the correct answer and code reference provided in the program.

A recent addition to Seminars and Company's study guides is their new 2000 IBC Plan Review Study Guide. Features of this new study guide are:

- Developed to help improve an individual's knowledge of the building codes as they relate to plan review.
- Referenced code is the 2000 IBC.
- Study guide is on a CD containing over 1000 questions with many plan review graphics developed to assist in preparing for the Plans Examiner Certification Test. ❑

The cost for each of these study guides is $69.00. They may be ordered from the Company's website: www.internationalcodes.com E-mail address is: codes@rosenet.net For telephone contact, call 541-440-6779. The mailing address is: Seminars & Company, 14794 North Bank Road, Roseburg, Oregon 97470.

2004 Virginia Building Code Academy Schedule and Certification Quick Reference Guide

The balance of the 2003 and the new 2004 Virginia Building Code Academy Schedule is found within this issue of the Code Connection Newsletter. The schedule outlines the module titles, dates, location and application deadline date. It should be noted that the mechanical, electrical, plumbing, building and property maintenance modules are now presented in a consolidated three-day format, covering both the residential and commercial elements of the inspection process. By completing these consolidated modules, individuals will meet the training requirements for state certification in both the residential and commercial inspection areas of a discipline. For example, the Electrical Module includes both the electrical general (commercial) and electrical one and two family dwelling (residential). Should you have any questions identifying your training needs you may contact Charlotte Carter, Training Program Manager, at 804-371-7184 or ccarter@dhcd.state.va.us.

Also found on our website: www.dhcd.state.va.us are two "Quick Reference Guides to Training and Examination Prerequisites for Code Enforcement Personnel to be Certified as Established by the Virginia Board of Housing and Community Development". Candidates seeking certification in Virginia now have two choices for recognized examinations. You may either register through Promissor to take the International Code Council (ICC) exams, or through Experior to take the National Certification Program for Construction Code Inspectors (NCPCCI) exams. ICC recognizes the NCPCCI exams; therefore, you can become ICC certified by taking the NCPCCI exam. ICC will continue to recognize the NCPCCI exams as long as NCPCCI continues to update their examinations on the current codes. Please note, there is no ICC certification category for elevator; therefore, elevator inspectors must take the NCPCCI elevator examination. For help in identifying and registering for these examinations, you may contact Sharon Finan, Certification Program Manager, at 804-371-7185 or sfinan@dhcd.state.va.us.

The Training and Certification Office would like to stress the importance of an applicant completing the Code Academy application in its entirety to be considered for the requested module. When the application is not completely filled out, staff cannot accurately assess the immediate need for the training. For information on either the Virginia Building Code Academy Training Schedule or the Quick Reference Guide to Training and Examination Prerequisites please call Daniel Gilham, Training and Development Manager, at 804-371-7181 or e-mail dgilham@dhcd.state.va.us. ❑

Virginia Building Code Academy

Department of Housing and Community Development
Training and Certification Office
501 North Second Street
Richmond, Virginia 23219
Telephone: 804/371-7180 Fax: 804/371-7092

Important Notice:
Check the box of the preferred class

This schedule sheet MUST accompany your application

October 2003 - December 2003

Check (only one)	Date	Class	Location	Application Deadline
	Oct. 7-9	Advanced Official's Module	Sheraton Park South Hotel -Richmond, VA	Sept. 8
	Nov. 4-6	Plumbing Module	Wingate Inn-Fredericksburg - VA	Oct. 6
	Nov. 18-20	Core Module	Thomas Nelson Community College - Hampton, VA	Oct. 17
	Nov. 18-20	Building Module	Wyndham Gardens Hotel- Richmond, VA	Oct. 17

January 2004 - December 2004

Check (only one)	Date	Class	Location	Application Deadline
	Jan. 12-14	Building Module	Sheraton Park South Hotel -Richmond, VA	Dec. 15
	Feb. 3-5	Property Maintenance Module	Holiday Inn North Hotel -Fredericksburg VA	Jan. 5
	Feb. 23-24	Plan Review -NON Structural	Wyndham Roanoke Airport - Roanoke, VA	Jan. 26
	Feb. 24-26	Electrical Module	Wyndham Roanoke Airport - Roanoke, VA	Jan. 26
	Mar. 16-18	CORE Module	Northern VA Community College- Manassas, VA	Feb. 18
	Mar. 15-16	Plan Review - Structural	Wingate Inn - Fredericksburg, VA	Feb. 18
	Mar. 15-17	Mechanical Module	Holiday Inn North Hotel - Fredericksburg, VA	Feb. 18
	Mar. 16-18	Electrical Module	Holiday Inn North Hotel -Fredericksburg, VA	Feb. 18
	Apr. 6-8	Advanced Official's Module	Brandermill Inn - Midlothian, VA	Mar. 8
	Apr. 13-15	Amusement Device Module	Holiday Inn Monticello - Charlottesville	Mar. 15
	Apr. 20-22	Plumbing Module	Wyndham Roanoke Airport - Roanoke, VA	Mar. 22
	Apr. 27-29	Property Maintenance	Wingate Inn - Fredericksburg, VA	Mar. 29
	May 3-4	Plan Review - NON-Structural	Woodlands Hotel & Suites - Williamsburg, VA	Apr. 1
	May 18-20	CORE Module	Southwest Higher Education Center - Abingdon, VA	Apr. 16
	May 10-12	Building Module	Holiday Inn North - Fredericksburg, VA	Apr. 16
	May 12-14	Plumbing Module	Holiday Inn North - Fredericksburg, VA	Apr. 16
	May 17-18	Plan Review -Structural	Sheraton Park South - Richmond, VA	Apr. 16
	June 14-16	Property Maintenance Module	Founders Inn - Virginia Beach, VA	May 14
	June 16-18	Building Module	Founders Inn - Virginia Beach, VA	May 14
	Sept. 14-16	CORE Module	Piedmont Community College - Charlottesville, VA	Aug. 16
	Sept. 13-14	Plan Review - Structural	Holiday Inn Monticello - Charlottesville, VA	Aug. 16
	Sept. 13-15	Electrical Module	Holiday Inn Monticello - Charlottesville, VA	Aug. 16
	Sept. 15-17	Mechanical Module	Holiday Inn Monticello - Charlottesville, VA	Aug. 16
	Oct. 5-7	Advanced Official's Module	Sheraton Park South - Richmond, VA	Sept. 6
	Nov. 15-18	CORE Module	Thomas Nelson Community College - Hampton, VA	Oct. 15
	Nov. 15-17	Building Module	Wyndham Gardens Hotel - Richmond VA	Oct. 15

Note: This schedule lists the planned offerings for the next 15 months based on historical needs. If the needs for a module exceed the capacity that has been planned/scheduled, the VBCA will schedule and provide more offerings of the needed modules.

Virginia Building Code Academy

APPLICATION FORM

Please fill this application out *completely* to be considered for a VBCA module

Do not forget to submit the schedule page showing which class you applied for.

1. Class Selection: Mark the one class on the schedule list that you wish to apply for - do not modify the form. A separate application is required for each class you wish to attend.
2. Applicant information: (print or type)

Name: _____ Title: _____

Employer: _____

Business mailing address: _____ City: _____ State: _____ Zip: _____

Business telephone: _____ Driver's Lic. Or SSN #: _____

3. Applicant's position description: Position title: _____

Number of years in this position: _____ Number of years in code enforcement/administration: _____

What is your primary responsibility as it relates to the USBC/VSFPC? _____

_____

4. Certification Plans:

A. Date you attended the CORE Module:

B. Have you previously been denied attendance to the class for which you are applying due to a lack of space? (Check box) ❑ Yes ❑ No

C. Will you be seeking certification within the next twelve months? ❑ Yes ❑ No

If you answered "yes", please list in priority order the Categories of Certification you will be seeking.

1. _____ 4. _____

2. _____ 5. _____

3. _____ 6. _____

D. If you have a provisional certification, please list the category of certification and its expiration date:

_____ Expires: _____

Important Note To Applicant: The preceding Sections 1 through 4 must be completed in their entirety by you, the applicant. Section 5 must be completed by the local Code Official. Failure to complete the form or to provide adequate information may cause the form to be returned without further action towards accepting the application.

5. A. Code Official's Endorsement: (NOTE: The "Code Official" as defined in the VUSBC/VSFPC.)

Name (print or type): _____ Title: _____

Business mailing address: _____ City: _____ State: _____ Zip: _____

Telephone number: _____ E-mail address (if applicable): _____

B. Code Enforcement: Is the applicant presently enforcing that portion of the code that is directly related to the class being applied for? (check box)

❑ Yes ❑ No Initials of Code Official: _____

C. Prioritization of Applicant(s): Applications are often received from more than one individual for the same class representing the same jurisdiction. As the Code Official, please prioritize this applicant, as compared to any other applicants from your jurisdiction, to this particular class, based on the greatest need you have. Please indicate whether this should be considered your 1st choice, 2nd choice, 3rd choice, etc.

Ranking: _____ Initials of Code Official: _____

Statement

(The applicant and Code Official must both read and sign the statement below. Notice to attend and a copy of the class rules will be sent to each participant subsequent to application acceptance.)

We understand that for a participant to receive credit for any module of the Virginia Building Code Academy, they must attend the entire module. Participants will not schedule any regular work activities during the period of the Code Academy. Course work missed due to personal or work related emergencies must be made-up prior to receiving credit for the course. If a participant cancels less than one workday prior to class, or does not arrive for the first night's lodging, their jurisdiction will be invoiced for the one night's lodging. If a participant does not use lodging arrangements requested of and provided by the Academy, the jurisdiction will be charged for all lodging costs not utilized.

Code Official's signature: _____ Applicant's signature: _____

There are no fees for participants attending the Virginia Building Code Academy who are engaged in code related work for local or State agencies that participate in contributing 1% levy funds in accordance with 36-137(7) of the Code of Virginia. Others will be required to pay tuition based upon an established fee schedule of the particular class. Participants must provide their own transportation and bear all associated cost such as tolls and parking fees. Living arrangements and meals will be provided in accordance with Code Academy policy and all classroom materials will be provided. Due to the limited number of spaces for all Code Academy classes, acceptance to each specific class must be necessarily limited. Each applicant will be considered on a case-by-case basis. Participants in academy classes will be assigned double occupancy rooms with another participant. If other lodging arrangements are desired, participants must make their own arrangements. If you have any questions, please do not hesitate to contact the Training and Certification Office at 804-371-7180 or through facsimile at 804-371-7092.

Mail application to:

Training and Certification Office
Division of Building and Fire Regulation
501 North Second Street
Richmond, Virginia 23219

NOTATION ON DUE DATES: Applications for individual classes will not be accepted after the "application deadline" date listed on the schedule of classes.

Department of Housing and
Community Development
The Jackson Center
501 North Second Street
Richmond, Virginia 23219

We're on the Web:
www.dhcd.state.va.us

Code Connection Subscription

The Code Connection newsletter is published by the Virginia Department of Housing and Community Development. The purpose of the publication is to keep interested parties aware of events on the state and local levels. The newsletter addresses training schedules, interpretations by the State Technical Review Board and articles of interest to building and fire-prevention professionals.

"Code Connection" may be accessed through the Department of Housing and Community Development's web-site: www.dhcd.state.va.us or an issue may be mailed to you "free of charge" by completing the subscription order form below:

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____ Email _____

Beneficial Features of the IRC
continued from page 1

Conventional Standards Established

In previous building codes, many construction materials or techniques required engineered design. In the IRC, new building materials and techniques of construction are now considered as conventional in nature and avoid the expense of an engineered analysis. For example, Structural Insulated Panels (known as SIPs) are factory-built wall frames. Under previous codes, manufacturers of these SIPs were required to submit engineering, testing, and evaluation of these products prior to its consideration for use. SIPs and other new products are regarded as conventional in the IRC under certain limitations and conditions. This saves the builder time and money. A design can be submitted for review using either of these new systems and reviewed by the building department. Also, due to the broad range of building practices across the nation, the IRC does not limit the standards of material installations and methods of construction to the regional variety. There are, for example, several methods for proper wood framing. Many of these are described visually in drawings, as well as in code language.

Costs Reductions

The IRC book costs less than its predecessors. The reason behind this is that the previous versions of model building codes generally were for both residential and commercial construction. These codes were usually in multiple volumes costing hundreds of dollars. Additionally, codes for utilities such as plumbing, mechanical, and electrical installations were contained in separate volumes. The cost to a builder exceeded several hundred dollars to acquire copies of every code. For the residential builder, the cost of the IRC is less than $50 for a complete code document.

Benefits

The IRC provides a single set of rules for the homebuilder that is clear and well illustrated. The clarity of the IRC surpasses that of any predecessor due to the inclusion of detailed drawings, sketches, diagrams, cutaway views, charts, tables, and graphs. Moreover, the IRC permits a wider variety of materials and methods of construction to be used without requiring a design. In the largest sense, the greatest benefit of the IRC is that it is a unifying document that establishes a common set of rules for residential construction throughout the United States. ❑